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THE PUBLIC DOMAIN AS A LAND PROBLEM

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OWYHEE COUNTY

I. THE PUBLIC DOMAIN AS A LAND RESOURCE.

A. Location and Extent.

Owyhee County is entirely south of the Snake river and west of Salmon Falls Creek in the extreme southwest corner of Idaho. The total area of the county is 5,091,840 acres. Of this, 308,585 acres or 6.1 percent is in farms, of which 48,606 acres were in crops in 1930, as compared to 57,404 in 1925; and 217,269 acres were in pasture in 1929, as compared to 125,792 acres in 1924. The Duck Valley Indian Reservation in Idaho includes about 153,000 acres or 3 percent of the total area of the county. The Department of the Interior listed 3,504,358 acres of unappropriated and unreserved land or so-called public domain on July 1, 1930, or about 69 percent of the total area of the county. The balance of the land in the county consists of state lands, owned range land, mineral claims, etc. Most of the public domain is in a large compact body, capable of being administered economically in mass, and without conflict with other interests.

B., Influencing Factors.

Topography. The southwestern portion of the county, which is drained by the forks of the Owyhee river and their tributaries, is characterized by numerous low, broad ridges and rather shallow, broad canyons, which often reach the proportions of large flats or small valleys. The streams frequently course through narrow, deep, box canyons.

The Silver Mountains form a high range in the middle of the west side of the county, some of the peaks being around 8,000 feet in elevation, from which the main ridges extend north and south. The immediate slopes on the east and west sides and the north and south ends of the Silver Mountains are steep and rough, but give way to long, low ridges and moderately deep canyons which continue to the Oregon line on the west, to the rolling country in the Owyhee river drainage to the south, and to the broad, gentle slopes to the north and east which extend to the Snake river. The central and most of the eastern portions of the county are drained by the Bruneau river and its tributaries. Most of the water courses are in box canyons between which are more or less long, broad benches sloping gradually to the north. The extreme eastern end of the county is similar to the Bruneau river country, but drains into Salmon Falls Creek or directly into the Snake river.

__Soil.__ The Silver Mountains are largely granitic with some quartz, porphyry and other igneous rocks. Soils derived from these rocks are gravelly to coarse sandy loams and are generally very fertile. Soils on most of the remainder of the country are mostly sandy or silt loams derived from lava. In the Owyhee Mountain area are a few patches of basaltic boulders almost barren of vegetation because of the sparseness of soil. The soils on the slopes near the Snake river contain considerable sand. The canyon bottoms are largely clay or silt loam.

Climate. The annual precipitation varies from about 13 to 15 inches at the lower elevations to 25 inches in the high mountains. Temperatures sometimes reach 25 or 30° below zero in the mountains, but zero weather is seldom experienced in the lower areas. Summer temperatures seldom reach 100° in the higher country but occasionally temperatures of 104° and even 106° are experienced adjacent to the Snake river. At the lower elevations killing frosts rarely occur between April 15 and October 15.

Water. In the Silver Mountains and the northern part of the Owyhee river drainage, water is present in creeks and living springs in sufficient quantities and well enough distributed for the livestock that graze there. The upper portion of the Bruneau river drainage also has sufficient water for livestock. The lower part of the Bruneau drainage and the eastern portion of the county have few places where water is available at all times of the year. The sides of the canyons are so precipitous that stock can get water only in a few places. There are very few permanent watering places except in these canyons. Most of the use of this area is in early spring when there are a few temporary streams running and snow banks or shallow ponds scattered over the range. There are times, however, when water from these sources is inadequate and thousands of livestock have to be trailed day after day in to the few permanent watering places to the detriment of both stock and range. At such times some water is hauled from permanent watering places to the livestock on the range.

C. Its Value and Significance.

1. As a range and forest resource.

All of the public domain in Owyhee County is intensively used range land. Large areas of it are commonly called "desert," but this term is misleading as it is not true desert type. A strip of 2 to 20 miles wide paralleling the Snake river may be properly called "semi-desert," as it is quite dry and the forage consists of so-called desert shrubs, principally shadscale (*Atriplex confertifolia*) and with lesser amounts of dwarf black sage (*Artemisia nova*), bud sage (*Artemisia spinescens*), and winter fat (*Eurotia lanata*). A Douglas fir-alpine fir type with a total estimated area of 20,000 acres occurs at the higher elevations around the heads of streams and on the north slopes. It consists principally of saplings and pole sized which are in pure stands in the most favorable sites, and mixed with brush and juniper at the lower limits and on south slopes. The forage in the fir type consists largely of browse species, chiefly snowberry (*Symphoricarpos spp.*), nine bark (*Opulaster malvaceus*), and aspen (*Populus tremuloides*).

There is a Juniper type (probably western juniper: *Juniperus occidentalis*) in the Owyhee river country which covers approximately 250,000 acres. Mountain mahogany (*Cercocarpus ledifolius*) is scattered throughout this type. Juniper is also found scattered throughout the Silver Mountains to the north.

The balance of the public domain is sagebrush-bunchgrass at the lower elevations and sagebrush-bunchgrass, mixed with mountain shrubs and a small amount of succulent herbs on the higher areas.

The higher areas are well adapted to grazing from late spring to early fall and are so used, and in addition are subjected to early spring use before the vegetation is ready for grazing. The sagebrush and semi-desert areas are especially suited to early spring and late fall grazing.

Timber. While there is relatively little timber on the public domain in Owyhee County, the small amount is quite important locally. The juniper is extensively used for fence posts and fire wood. Numerous wood roads lead into the hills, over which are hauled each fall hundreds of loads of mahogany, juniper and other fuels for winter use. In the Silver City vicinity and around other mining areas the fir and other suitable trees are cut as fast as they become large enough for mine props and related uses.

At one time considerable areas of the Silver Mountains supported good stands of Douglas fir and alpine fir. These stands were repeatedly cut for mine timbers and fuel until now only scattered trees and reproduction remain on the most favorable sites. Considerable damage was done by fire to these timbered areas in the early days. At one time sawmills were located on Reynolds, Sinker, Harts, Boulder and Pickett Creeks, but at the present time there are no sawmills as the timber is virtually gone.

Relation to livestock industry. The public domain range in Owyhee County bears an extremely important relationship to the economic structure of southwestern Idaho. The livestock industry is one of the most important

in this region. The 1930 census shows Owyhee County to have 177,718 sheep, 25,254 cattle and 6,458 horses. Only a part of these belong to local ranchers. Many of the farms and practically all of the local ranches operate on a basis of obtaining their income from livestock. Much of the crop from the farms and practically all from the ranches is forage of some kind or other to feed livestock during the winter, or to fatten them in the fall. Spring and fall range is furnished by Owyhee County for many cattle and sheep that graze on the Humboldt National Forest in Nevada in the summer and spring range is furnished for probably over a hundred thousand sheep that graze on the Boise and Sawtooth National Forests and other range areas nearby during the summer season. In addition, thousands of livestock from Oregon farms and ranches come into the western portion of Owyhee County for grazing from spring to fall.

2. As a watershed resource.

While much of Owyhee County is open range area and farming is not practiced extensively within the county, the public range is nevertheless an important watershed. Following is a table showing the acres that have been filed on for water which has its source in Owyhee County. These data are taken from publications by the Geological Survey (3) and State records.

Stream	Acres Watered
Sucker Creek	2193 acres
Poison Creek	316 "
Jump Creek	845 "
Squaw Creek	1110 "
Reynolds Creek	4552 "
Sinker Creek	1973 "
Picket Creek	2339 "
Catherine Creek.	1290 "
Harts Creek	2154 "
Bates Creek	155 "
Browns Creek	762 "
Castle Creek	1115 "
Bruneau River, Idaho, (all tributaries)	20,000 "
Owyhee River, Idaho	10,000 "
Owyhee River, Oregon, (affected by Idaho conditions.	38,000 "
Total	86,804 "

(3)

The Geological Survey lists the following storage reservoirs which are affected by watershed conditions in Owyhee County:

Name	Stream	Capacity Acre-Feet
Riddle	Marys Creek	1,000
Foreman	Castle Creek	2,300
Sinker Creek	Sinker Creek	2,800
Owyhee River Basin.		
Owyhee	Owyhee River	716,000 (Oregon)
Blue Creek	Blue Creek	1,900 (Idaho)
Little Blue Creek	Little Blue Creek	1,910 "
Payne Creek	Payne Creek	220 "
Rubelt	Shoofly Creek	930 "
Juniper	Owyhee River	1,400 "
Antelope	Jordan Creek	35,000 (Oregon)
Upper Cow Lake	Cow Creek	3,100 "
Lower Cow Creek	Cow Creek	3,600 "
	Total	770,160 Acre-Feet

3. Wild Life Resources.

There are several small streams in Owyhee County that offer fairly good fishing, but this resource as a whole is quite limited, considered county-wide. There are several localities having unusual beauty of scenery and are attractive camping places. These, however, are also very limited and are for the most part under private ownership, so may be left out of further consideration.

The county has several places of special historical interest, being scenes of important events in local history. The deep box canyon of the Bruneau river is noted for its scenic value, but neither of these values is likely to be affected by what might happen to the public domain.

That the country formerly supported considerable game is shown by the following excerpt from a history[1/] of Idaho, published in 1884:

"The county is full of game as may be seen from the following newspaper item of late date: 'Hon. T. D. Cahalin and Mr. Strode and family returned last Wednesday from a pleasure trip in the Mahogany Mountains in Owyhee County. They report having a good time. Cahalin killed 45 deer in two days. He also killed 3 ibex, 7 antelope, 147 grouse, 1 badger and 1 snowshoe rabbit.'"

This history[1/] further states in describing Owyhee County that "The plains are the favorite resort of game."

Mr. C. A. Ross, a ranchman residing at Three Creeks, Idaho, who came to Owyhee County in 1888, stated that at the time he came to the county there was an abundance of deer, antelope, wild chickens and fish.

1/ Numbers refer to bibliography at the end of the report.

Bruneau residents could obtain plenty of deer around Clover (a ranch situated on Bruneau river) in the winter.

At the present time deer, antelope, wild chickens and fish may still be found in the country, but not nearly in their former abundance. There are a few small flocks of wild chickens. A small number of deer are found in the rougher parts and they are fairly plentiful in some of the juniper cover in the Owyhee river drainage, but are very sparse elsewhere. There are a few small herds of antelope in portions of the county, but generally they are seldom seen.

The interstate movement of stock is an important factor in Owyhee County and will merit special attention if and when plans of control or administration of the public domain are considered. There is a well established major movement of stock between Idaho and Oregon on the west, and between Idaho and Nevada on the south. Serious financial and social injury would result to the farmers, ranchers and livestock men affected if this legitimate drift were curtailed.

II. CONDITIONS ON THE PUBLIC DOMAIN

A. Present condition of the range as compared to former conditions.

Historical records indicate that at the time of settlement the range in Owyhee County produced an abundance of good forage. The following discussion points out the condition of the range at the present time as compared to former conditions.

The desert shrub type which parallels the Snake river, making a belt from 2 to 20 miles wide, was used extensively as a winter range in the "early days." That it became depleted early is shown by the following excerpt from a history[1] of Idaho printed in 1884. "The winter range is not so good as it was in years past, having been eaten out by the large numbers of cattle in our county and by those driven through by eastern buyers and cattle from Nevada." Mr. Lester Lewis, who has resided in Silver City, Idaho, for many years, in 1932 stated that in the early days of Silver City the many oxen and horses used in the mines were taken to the range around Murphy for the winter where they would subsist in good flesh on the highly prized "white sage," (winter fat *Eurotia lanta*). Practically no winter fat is found in this section now. An old resident of Murphy, whose name was not learned, stated that formerly the country in the higher foothills west of there abounded in bunchgrass (blue-bunch wheatgrass, *Agropyron spicatum*), and

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[1] Numbers refer to bibliography at the end of the report.

that sand grass (Indian mountain rice, Oryzopsis hymenoides), and white sage grew abundantly in the semi-desert type surrounding Murphy. Mr. Turmes, an old resident, and Mr. Cullen, who was reared in the county, both of whom now reside on the Cullen ranch on Shoofly Creek, stated in 1932 that there was once much "white sage" and "sand grass." They pointed out an area of hillside range inside the fence which encloses their field, on which is growing a good stand of winter fat and scattered bunches of Indian mountain ricegrass, as representative of earlier conditions on the range in that vicinity. The winter fat now practically stops at the fence line and only a little Indian mountain rice grass may be found outside. It is also readily apparent from site conditions that these species were once more abundant on the range. They also stated that shadscale is not as dense as it once was, though there is still a fairly good stand of this species.

These reports are indicative of what has happened to practically all of the range in Owyhee County. It is estimated that the desert shrub and sagebrush types, on the average, have depreciated about 80 to 90 per cent as compared to former conditions. In nearly all cases the native more nutritious bunchgrasses have declined greatly. In most instances the sagebrush has increased to some extent but as an average the total cover is less than it used to be. This conclusion is based on the detailed study of a number of representative examples.

In order to obtain specific information on actual changes in the vegetative cover as a result of the grazing use on the public domain,

areas protected or partially protected from grazing and which represented the former conditions of the range were compared with the open range. These natural or semi-natural areas were generally hillside range included within a fence surrounding a field from which livestock are excluded until after hay crops in the bottom lands have been harvested; and which most owners protect from the excessive use given the open range. In every case the areas compared are practically identical as to elevation, soil, moisture and all other factors affecting the growth of plants except the degree and kind of grazing use. The method used consisted of selecting at random from 1 to 30 plots on each condition to be compared, care being taken that the total plots gave a true average of cross-section of the total area the plots were to represent. The data obtained on the character and quality of vegetation on each of the plots were then compiled and analyzed to obtain an average. The conditions on the protected areas were then compared with those on the open range and deductions made as to changes which had taken place as the result of the past grazing use on the public domain. It should be borne in mind that in most cases the so-called protected areas are not truly such. Most of them are grazed each year and may be somewhat depleted, although it is believed none are seriously so.

Studies were made in the vicinity of Three Creeks and extending on down through the Bruneau country from Three Creeks to Clover, and from Clover twenty miles north towards Bruneau. The plots were taken over an

area about 50 miles long, but are fairly typical as to site, condition, type of vegetation and extent of depletion of approximately 2 million acres of public domain in Owyhee County.

Note: In the following tables the upper row of figures under Plant Cover Index represent the relative quantity (in plant density) of the several classes of vegetation on a representative example of moderately grazed or "conserved" range, the sum of the index values of all the groups of vegetation amounting to an index value of 100. The grazing capacity of the conserved range is also assigned an index value of 100. The second row of figures show the present index value of the open public domain when using the index of the conserved range as a base. The third row of figures represents the change (+ or -) of the open public domain as compared to the approximate original condition of the range as represented by the example of conserved range. Thus it is apparent in the first table that grasses on the open public domain have declined, as compared to former conditions, from an index of 75 to one of 28; weeds have not changed in quantity. The better browse plants are slightly greater in quantity and inferior browse plants (in this case chiefly sagebrush) have increased from an index of 15 to one of 49 and the combined plant cover has declined from an index of 100 to an index of 88. The carrying capacity has declined from an index of 100 to an index of 16.

Example No. 1, Bruneau River Drainage.

This range is chiefly of the sagebrush type which at one time supported a good stand of native bunchgrasses, principally blue-bunch wheatgrass, sandberg bluegrass (Poa sandbergii), Idaho fescue (Festuca idahoensis), giant wild-rye (Elymus condensatus), Indian mountain rice-grass and squirreltail (Sitanian hystrix).

Bruneau River Drainage

Name of Area	Transect No.	No. of Plots	Plant Cover Index					Grazing Capacity Index
			Grasses	Weeds	More Valuable Browse	Inferior browse	Total Plant Cover	
Conserved area	3	8	75	6	4	15	100	100
Open Public Domain	4	30	28	6	5	49	88	16
			-47		+1	+34	-12	-84

It will be noted from the above table that the bunchgrasses have been greatly depleted and sagebrush has increased on the open range.

The open public domain in this vicinity has declined approximately 84 percent as compared with similar but moderately-grazed range. The total plant cover is only approximately 12 percent less than on the moderately-grazed range. However, the native bunchgrasses have declined about two-thirds and inferior browse species, principally sagebrush, have almost trebled in quantity. The decline in the grasses is more serious than the figure indicates, as the larger and more palatable species, namely blue-bunch wheatgrass and giant wild-rye, have almost entirely disappeared on the open range and the grasses that remain are chiefly Sandberg bluegrass, a short grass that forms very small and short bunches, and squirreltail grass, which is also quite small and is less palatable than

the other grass species.

Example No. 2, Three Creeks.

The higher hillside range in the vicinity of Three Creeks, but which represents a relatively small area, has not declined as much as the large sagebrush type discussed above, as is shown by the following table.

Name of Area	Transect No.	No. of Plots	Plant Cover Index Grasses	Weeds	More Valuable browse	Inferior browse	Total plant cover	Grazing capacity index
Inside Nat'l. Forest	1	1	50	7	42	1	100	100
Adjacent pub. domain	2	1	26	6	16	-	48	53
			-24	-1	-26	-1	-52	-47

In this locality the total plant cover on the open public domain is 52 percent less and the grazing capacity 47 percent less than on a well conserved area on similar range inside the national forest. Grasses have declined from an index of 50 to an index of 26 or 48 percent.

The changes shown in this study are in harmony with testimony of local residents who have been in the country many years. Mr. C. A. Ross stated in 1932 that formerly bunchgrass over practically all the range was "thick enough to cut as hay" were it not for the intermingled sagebrush which, however, was not nearly as thick then as it is now.

The Elk Valley addition was made to the Humboldt National Forest in 1912. This tract, although entirely in Nevada, is adjacent to the Idaho state line, was similar in condition and cover to the adjacent public domain in both Nevada and Idaho. Since being placed in national forest, this tract has been used by permittees residing in Idaho. One of these permittees,

J. E. Haws, in 1932, stated there has been such a marked improvement of the range within the national forest that now the national forest range forms distinct contrast with the poor condition of the open public domain. He stated further that the native bunchgrasses are coming back on parts of the Humboldt National Forest until it now appears as it did when he came to the country in 1888. That the range within the national forest has improved considerably is further shown by the fact that the boundary can be readily distinguished from a distance of several miles, owing to the much greater plant cover within the forest. It should be borne in mind that this improvement has come about under grazing use through proper management.

Example No. 3.

Another study in the expansive sagebrush type in Owyhee County made on Cow Creek about 8 miles southeast of Sheaville, Oregon, is indicative of what has happened to some 400,000 acres of sagebrush type lying to the east, northeast and north of Cow Creek.

Name of Area	Transect No.	No. of Plots	Plant Cover Index					
			Grasses	Weeds	Valuable browse	Poor Browse	Total Plant Cover	Grazing Capacity Index
Inside Field fence	7	4	71	16	7	6	100	100
Privated fenced range	8	4	27	7	10	23	67	12
			-44	-9	+3	+17	-33	-88
Inside field fence	9	4	71	16	7	6	100	100
Open pub. domain	10	4	23	9	9	35	76	11
			-48	-7	+2	+29	-24	-89

This comparison indicates that the total plant cover on the open public domain is 24 percent less than that on moderately-grazed range; grasses have been depleted 68 percent and the species producing the greatest volume

and having the highest palatability have almost entirely disappeared; inferior browse, mostly sagebrush, has increased to 4 times its original quantity and the carrying capacity has declined about 88 percent. Practically the same change has transpired on the privately-owned fenced range. Numerous fence lines between moderately-used range land enclosed within fields and potentially similar open public domain in this vicinity can be detected from the distance due to the stand of grass showing up on the unplowed land inside the field fence, but which has been greatly depleted on the outside.

Example No. 4.

A study was made of the sagebrush type on the public domain in the Blue Creek drainage northwest of Riddle, Idaho. This range is compared with similar conserved range in the fields at Triangle, Idaho.

Name of Area	Transect No.	No. of plots	Plant Cover Index: Grasses	Weeds	More Valuable browse	Inferior browse	Total plant cover	Grazing capacity index
Protected	16	11	68	9	13	10	100	100
Open public domain	17	10	21	17	20	8	67	6
			-47	+8	+7	-2	-33	-94

This comparison shows a decline of one-third in the total plant cover and 94 percent in grazing capacity. The grasses have decreased from an index of 68 to 21, or 69 percent. Here, again, the larger and better grasses have been the most heavily depleted and the remaining varieties are the smaller and less palatable grasses.

For many years the Sewell family has owned the Blue Creek ranch in the vicinity where the above study was made. Charles Sewell, present manager, whose father established the ranch, stated that he often heard his father say that in the early days native grasses were abundant everywhere and that it seemed unlikely there would ever be enough livestock in the country to utilize it. No hay was fed except to saddle horses and range livestock "wintered out" well on the matured grasses. Charles Sewell says that he remembers there having been much more grass on the range in the past as compared to the present. When asked if the range is different now he answered: "I'll say it is. We have to feed six months a year now!" When questioned as to the cause of the change he first replied it was brought about by drouth, but on second thought said that it could not have been drouth because one can detect a field fence line for many miles in the distance due to the good stand of grass on the inside where protected and the heavy sage and lack of grass on the open range, and that, therefore, the change in vegetation must have been brought about by grazing abuse.

Example No. 5. Triangle.

The results of the studies in the vicinity of Triangle and about 15 miles northwest of Triangle, where hillside range lands enclosed within fields were compared with the open range, are indicative of the condition of all the open public domain range in that general vicinity. This is a rolling, sage-bunchgrass country, which adjacent to the ranches, has been grazed for years by cattle and horses, and farther back from the ranches by sheep, cattle and horses. The State of Idaho has a law which makes it illegal to graze sheep within two miles of a ranch dwelling,

except that the law does not prohibit a person from grazing his own sheep on his own ranch.

Name of Area	Trans. No.	No. of Plots	Plant Cover Index					Grazing Capacity Index
			Grasses	Weeds	Good browse	Poor browse	Total density	
Range in fields	14	11	68	9	13	10	100	100
Open Pub.Domain	15	27	35	19	14	27	95	9
			-33	+10	+1	+17	- 5	-91

The foregoing comparison indicates there is only 5 percent less total plant cover, but 91 percent less grazing capacity on the open public domain as compared to an area representing former conditions. Grasses have declined from an index of 68 to 35, or almost a 50 percent decrease. Weeds have increased from 9 to 19, or about 100 percent, but this increase is practically all in species of little value for grazing. Good browse remains about the same, but poor browse species, mostly sagebrush, have increased from an index of 10 to 27, or about 170 percent.

Some idea of the rate and degree of improvement that might be expected on the open public domain range in this vicinity is obtained from a comparison with range inside a field fence, erected in 1927 by the Joyce Brothers. At the time of fencing the range now enclosed was in the same condition as the surrounding area, which is still open public domain. Since the fence was constructed the field has had five years of conservative use.

Name	Trans. No.	No. Plots	Plant Cover Index					Grazing Capacity Index
			Grass	Weeds	Good Browse	Poor Browse	Tot.Pl. Cover	
Upper Joyce Field	11	3	54	15	2	29	100	100
Open Public Domain	12	3	22	39	-	40	101	39
			-32	+24	+2	+11	+ 1	- 61

These data show that the degree of plant cover is the same on both areas but the grazing capacity is 61 percent less on the open public domain. Grasses show a difference in index of 54 as compared to 22, or 60 percent less on the open public domain. Weeds show a difference of 39 as compared to 15, or 160 percent more on the open range, but these are mostly worthless species. Inferior browse species, mostly sagebrush, show a difference of 40 as compared to 29, or 38 percent more on the public domain. This bears out the conclusion of students of range management, namely, that on most native sagebrush-bunchgrass ranges sagebrush not only increases to replace the grasses as the latter are depleted, but if conditions become favorable for the improvement of grass it often is able to reduce and hold in check the sagebrush.

Example No. 6, Silver Mountains.

The high range in the Silver Mountains has been and potentially still is a first-class range, but due to extremely heavy grazing and trampling and to too early use in the spring, it has been heavily depreciated. The undisturbed corner of a lot fenced years ago for use as a garden and the cemetery (Photo No. 1) in Silver City afford a comparison of original

conditions with present conditions on the open range. A number of old residents pointed out these places as examples of how all the range "used to look", and there is no reason to dispute them since these areas have been subjected to no disturbing causes to change them from a natural condition.

Name of Area	Trans. No.	No. of Plots	Plant Cover Index					Grazing Capacity Index
			Grasses	Weeds	More Valuable browse	Inferior browse	Total plant cover	
Protected	5	4	72	27	1		100	100
Open Range	6	4	2	23	1	4	30	8
			-70	-4		+4	-70	- 92

This comparison shows a decline of 70 percent in total ground cover and one of 92 percent in grazing capacity on the open range. The most significant change is in grasses which have declined from an index of 72 to an index of 2, or almost complete removal. These results are in conformity with the observations of many old-time residents. They uniformly tell of the wonderful grass stand that formerly existed, but which is now virtually gone due to the heavy grazing and grazing in the spring, when the ground is still wet and the plants have barely started growth. They also tell of the almost complete disappearance of "sunflowers" (Balsam root, Balsamorhiza sagittata), and other palatable weeds. The forage plants on the open public domain in this vicinity are grazed to the ground by fall every year and many plants with exposed roots and also many dead plants may be observed. The shrubs have been overgrazed until many of the twigs are dead and the living branches

and twigs are closely hedged. Photo No. 2 portrays some of these conditions.

Fortunately the story is not altogether one of serious depletion, There is an area of approximately 20 townships extending approximately from T. 7 S., to T. 11 S., and from R. 1 E., to the Oregon line through which are found scattered parcels of open public domain range in fairly good condition. This range has been given some measure of protection against excessive use by the exercise of an injunction against sheep grazing in the Juniper mountains where there was prior use by cattle. This prevents extra heavy use by both classes of stock. There are also several privately-owned fenced ranches and ranges within the area which more or less isolate some of the public domain ranges, which are not grazed by sheep because of the enforcement of the State law that prohibits sheep grazing within 2 miles of a ranch dwelling. Even within this area, however, are tracts of public range, some of which are depleted lightly and others seriously. The range near Triangle, which has already been discussed and which showed a decline of 91 percent in grazing capacity, is on the edge of this area.

2. Watershed Conditions.

As naturally would be expected with such serious and wide-spread depletion of the plant cover, there is considerable erosion on the public range lands in Owyhee County. Rather serious erosion exists in every part of the county except in portions of the Owyhee Mountain country, and even there is found some degree of accelerated erosion. Several forms of erosion

are common in the county. Evidences of sheet erosion are distinct over practically all of the sagebrush type, which occupies the larger part of the public lands. This erosion is shown by hummocks from 2 or 3 to 7 or 8 inches in height above the general level of the soil, which has been held in place by sagebrush or grass clumps while the surrounding soil has been blown or washed away. Photo No. 3. The washing by water is further shown by the presence of numerous shallow shoe-string gullies on what should be smooth hillsides. The work of both wind and water is shown by a congestion of small rocks (erosion pavement) on the surface which do not appear in abundance in the top layers of the soil. These rocks have accumulated on top of the soil as a result of sheet erosion, which has removed the fine soil and left the rocks in place. "Creep" erosion is found in the coarse sandy and sandy loam soils in the Silver Mountains. Due to the removal of protective plant cover by abusive grazing and heavy trampling by livestock loose surface soil has moved or "crept" down the slopes. This erosion is indicated by the piling up of soil on top and on the upper side of plants and the moving away of the soil from the lower side of the clumps. Usually the clumps are totally covered on top except for a fringe. Where this condition exists are found many clumps with exposed roots and some are almost completely dug out. Many of the plants are weakened and some are dead.

The most conspicuous form of erosion is gullies ranging in size from 1 to 2 feet in depth and to 15 feet in width and 10 feet in depth. There are washes as much as a hundred feet wide and 10 to 15 in depth in

the alluvial fills of the valleys. These gullies are recent and are still in active progress as is indicated by their perpendicular sides, fresh caving of banks and living or recently dead vegetation at the edge of the banks with roots hanging over or exposed in the banks. The flocks of man have destroyed much of the vegetation which in times past restrained the flood waters and bound the soil, until at present run-off accumulates rapidly and with its erosive powers increased by the sediment it gathers, washes away thousands of tons of unprotected soil each year. Photo numbers 4 and 5 portray some of the erosion in the county. Removal of the timber on a limited area in the Silver Mountains has probably also been a contributary factor to more flashy run-off and erosion.

As the result of the erosion and floods, road maintenance has been increased. Washouts sometimes occur in the roads of the county, causing inconvenience to the traveling public. Photo number 6 shows a bridge that will soon need replacing. The common reply to inquiries about some of the back-country roads is that "You can travel it if it hasn't washed out;" or "You can't go that way any more because the road has washed out." A citizen of Bruneau, while discussing the gullies in the road leading into the Bruneau Valley from Clover, a portion of which has been subjected to considerable washing, stated "The county will have to do some work on it before wool hauling starts again." A group of residents of Murphy was asked if there were any floods in Rabbit Creek which runs through the town. "I'll say there are" was the

reply. "They have just about washed this town away 3 or 4 times." They stated further that water sometimes becomes 8 or 10 feet deep during flood stages. Mr. and Mrs. Webb of Bruneau stated that high water sometimes comes into Bruneau Valley, causing some damage. When asked how long there have been floods, one old resident replied that there were none 30 years ago, which further bears out the belief that the depletion of the forage cover is the principal contributing factor to the erosion and floods.

It seems evident that the erosion in Owyhee county is causing a serious problem to irrigation projects, which is manifested in silting of reservoirs resulting in reduced storage capacity, filling of canals and ditches, washing of diversion gates, etc.

The streams in Owyhee County are reported to be flashy with a decided tendency for the peak run-off to come earlier and earlier of recent years. This condition is generally attributed to the removal of timber from the watershed and to its (the watershed) being heavily overgrazed for a number of years.

III. EFFECTS OF PUBLIC DOMAIN CONDITIONS

A. Range livestock industry.

Historical records indicate the effects of change in conditions of the range in Owyhee County. The first settlement was made in 1868 in Bruneau Valley near the present site of the town of Bruneau. The following are excerpts from a history[1] of Idaho: "The ranchers collected about them some stock. . . . .(which) increased rapidly. Cattlemen hearing of the excellent range for stock, drove cattle here in large numbers, until today there are probably more in Owyhee County than in any other in the territory. . . . . The summer range for cattle is almost inexhaustible, every hillside furnishing a luxuriant growth of bunchgrass. . . . . Owyhee is not only good farming, but the best cattle county in the territory." This history states that the Hyde Brothers used to run between 10 and 12,000 cattle. Another history[2] states they increased their number to 15,000 head. A daughter of Mr. Hyde, Mrs. Webb, who resides in Bruneau, Idaho, recently verified these figures.

The history of Owyhee County[2] gives the following account: "The valleys of Bruneau, Reynolds Creek, Castle Creek, Catherine Creek and Sinker Creek are unsurpassed for fertility and productiveness of soil, and the mountain slopes in season are luxuriant with the most nutritious grasses."

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[1] History of Idaho Territory, Its Resources and Advantages. 1884.

[2] Historical, Descriptive and Commercial Directory of Owyhee County, Idaho. 1898.

"It was early discovered that cattle that were fed on the nutritious bunchgrass and white sage that abounded on the plains and mountain slopes of Owyhee County attained a perfection of bone, muscle and flesh not equaled by any other locality and this lead to a rapid settling of the ranges of Bruneau, Reynolds, Castle, Catherine, Sinker, Cow and Sucker Creeks, which were speedily covered with immense herds of hardy cattle."

This publication states the assessed number of cattle in 1882 is given as 25,559, but that it believes this number to be 6,000 short. It gives the estimated number of cattle as 60,000 in 1885. The author states he is reliably informed that the maximum was reached in 1888-9 when there were 100,000 cattle.

The winter of 1888-9 was an extremely hard one in at least the northern half of Nevada and southwestern Idaho. All of the "old timers" remember this long winter vividly as a time of a shortage of feed and unusually deep snow. Thousands upon thousands of cattle and horses died. Mr. J. E. Haws, a prominent cattleman residing near Bruneau, stated in 1932, that the Murphy outfit branded 2,500 calves annually before the hard winter but only 250 afterwards, having lost about 90 percent of the breeding cows. Similar statements have been made by other old residents. It is variously estimated that at least 80 percent of the cattle and horses died during this period.

The range apparently was considerably depleted as the result of the heavy use prior to 1888-9, but it at least partially recovered during the several succeeding years during which there was a reduced number of cattle. However, the cattle gradually increased again, but have never reached anywhere near the numbers there were in the county prior to the hard winter.

According to historical records the first sheep were brought into Owyhee County by Robert Noble at an early date. Mr. J. M. Bratton brought sheep into the county in 1888. John and Arthur Pence came with 2 bands in 1888 or 1889. Sheep increased rapidly during the 90's until they reached an estimated number of 150,000 in 1898. Two men named McCrea and Rogerson, started with a small band in the early 90's which they increased to 15,000 by 1900. About 1915 and 1916 sheep started to come into the county in large numbers from the Snake River country for spring grazing, the early lamb business having started there prior to that time. These sheep are first grazed on the plains north of Snake river and are then brought into the Bruneau river country to graze until the latter part of May or early June, when they start trailing to the summer range on the Boise and Sawtooth National Forests and vicinity.

Use of the so-called "Bruneau desert" in Owyhee County as spring range by sheep from the Snake River Valley country is carried on extensively at the present time. Mr. Ralph Wilson, Deputy County Assessor residing at Bruneau, Idaho, estimates that an average of about 200,000 sheep months use is made annually of this area, which includes approximately all of the Bruneau River drainage. He stated there were about

150,000 sheep on the area during the spring of 1932, which was an unusually high number, however, as the number there in the spring is usually nearer 100,000. About 5,000 of these sheep are from Nevada and the balance from Idaho. A few of these sheep remain in the country all year, being owned locally. Only local sheep graze in the Bruneau country in the fall.

Not only has the Owyhee County range been subjected to very heavy grazing, but also to too early grazing. The sheep come into the country in the spring when the feed is extremely short and often when the ground is still wet, and cattle are turned onto the range when the first green growth appears. Sheep go into the higher portions of the Silver Mountains as soon as the snow leaves and remain until fall. This early use as well as excessive number of stock have contributed to the depletion.

Wild horses or mustangs are another factor that must be considered in the use of the range. From soon after settlement began until the last year or two the range has been overrun with mustangs. Many residents state there were thousands of them since they could be seen in every valley or on every ridge. The hard winter of 1888-9 depleted their numbers for a few years but they rapidly increased again. During the World War many of the better animals were rounded up and sold to the various Governments. Subsequently they increased again until a market was opened up for them about 5 years ago for chicken and fox feed and meat by-products. Since then so many have been sold that only a tithing of their former numbers are left. Messrs. Wilson, Webb, Haws, Bachman and

other reliable informants state that at least 10,000 of these horses have been taken out of the county during the past 4 or 5 years. Bands of 400 or 500 at a time and in one case 700, have been driven into Bruneau for shipment to the packing houses. These horses have sold for around 90 cents per cwt., or about $7.50 cash. Obviously, this constant and uncontrolled use has been a factor in the depletion of the range.

The direct affect on livestock production of the reduction of carrying capacity of the range in Owyhee County can be appraised only in general terms. The partial change from cattle to sheep and the spring grazing of sheep from outside the county, especially since about 1912, greatly complicates the records of use. The following table gives local historical records for 1888 and prior thereto and the census records since and including 1890. Uncounted "mustang" horses are not included.

(shown yr. prior to census.)

Year	Cattle	Horses	Sheep
1882	31,500	-	-
1885	60,000	-	-
1888	100,000	-	-
1890	11,670	6,370	55,150
1900	11,691	13,160	177,744
1910	28,758	7,465	167,554
1920	46,171	9,634	185,945
1925	38,998	9,717	84,062
1930	25,254	6,458	139,492

The above figures are not exactly comparable, since the 1890 and 1900 census were taken on June 1, those of 1910 on April 15, those of 1920 and 1925 on January 1 and those of 1930 on April 1. To reduce the

1890 figures to a more comparable basis the numbers of calves and colts shown as born in 1889 were deducted from the 1890 census figures, since the number born in 1889 and 1890 should be approximately the same. For 1900, the stock under one year old are omitted. For 1910 the spring calves, colts and lambs are omitted. For 1920, 1925 and 1930 all the stock are included.

It is fairly certain that about 100,000 cattle and at least 50,000 head of sheep were grazed on the range in 1888. The greater part of the cattle ran on the range yearlong without supplemental feed and most of the sheep were on the range in Owyhee County at least 10 months out of the year. These livestock and periods of use aggregate approximately 110,000 head of cattle on a yearlong basis, (sheep converted to cattle units at a ratio of 4 to 1). In 1910 there were 28,758 cattle, 7,465 horses and 167,000 sheep when reduced to yearlong cattle units on the basis outlined above amount to about 71,000 head of cattle yearlong. By 1920 there had been a material change in operations. At least 3 months feeding of cattle had become necessary. Probably 100,000 of the sheep were in the county not to exceed two months and the remainder would not average more than 8 months on the range, or a computed 63,500 head of cattle yearlong. By 1930 this figure had been further reduced to 26,000 yearlong cattle range units. In addition, by about 1930 almost 10,000 head of mustang horses not previously accounted for had been removed. The range is all fully occupied and over-utilized at the present. Thus there had been by 1930 a decline of about 75 to 80 percent in number of range livestock units produced as compared to the

heyday of 1888 and a reduction of about 63 percent since the later peak during 1910 to 1915 during the heavy influx of sheep for spring grazing.

In addition to the great reduction in the numbers of stock it is possible to graze, the over-grazed range causes generally more risk and higher losses from drought, poorer flesh and poorer breeding condition of the stock that are grazed, and greater expense for feeding. In the early history of the county it was not necessary to raise hay for winter feeding. Later it became necessary to raise some hay but not nearly as much as is now necessary. Mr. Haws, a resident stock man, stated that formerly only about two-fifths of a ton of hay per head was sufficient for supplemental feeding of cattle during winter, but more recently, due to the lengthened feeding season, it is necessary to feed three-fourths of a ton of hay per head each winter or about twice as much as before. Some of the owners of hay ranches have gone out of the cattle business and are selling their hay to other stockmen.

The depletion of the available saw timber has meant a loss of a wood supply for the local settlers. This loss is keenly felt in the Silver Mountains by the many miners in that locality who need a constant supply of poles for mine props, etc. The rancher has lost his local supply of poles for derricks, corralls, potato cellars, etc.

The loss of much of the resource is an important factor which is generally not fully recognized. The losses due to erosion and watershed destruction have already been discussed.

The great need in the county is control and management of the public lands. Numbers of animals grazed must be reduced to the carrying

capacity of the land. Too early grazing inthe spring should be prevented so far as it is consistent with the essential needs of the livestock industry. Livestock must be properly managed on the range. The forage, game and timber resources need to be rehabilitated. The many years of uncontrolled use which has existed up to the present time shows that such use leads only to destruction of the resources. A change that will cure these economic ills should be affected. The people cannot afford to own and control the land. This limits the field of control and management to public agencies, who are in a position to handle it. The people must decide which of these agencies should be given this responsibility, but no matter which, rehabilitation or restoration of the resources rather than exploitation and revenue production, or use as a political plum or football, must be the objective. The country, though young, is virtually worn out already. Surely, we are long past the time when some agency of the people should be charged with the responsibility of taking care of these valuable resources. Further delay should not be tolerated.

Bibliography

(1) History of Idaho Territory, Its Resources and Advantages. 1884

(2) Historical, Descriptive and Commercial Directory of Owyhee County, Idaho, 1898.

(3) Utilization of Water Resources of Snake River Basin. 1932. By W. G. Hoyt.

Photo No. 1. The grass type in a mixed grass, browse, weed range totally protected from grazing in an unused part of the cemetery at Silver City, Idaho. Perennial grasses of high forage value occupy 72 percent of the total plant cover.

Photo No. 2. Dead or closely hedged browse on open range near Silver City, Idaho. Excessive and too early grazing has almost totally destroyed the grasses on this range and has caused a 92 percent reduction in the grazing capacity.

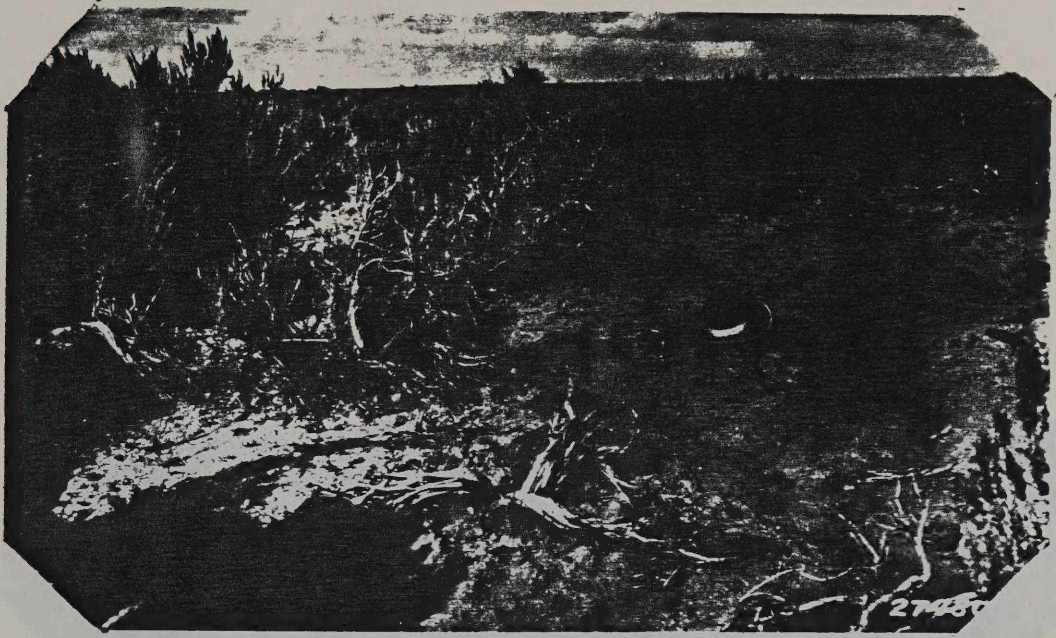

Photo No. 3. Sheet erosion in the sagebrush type on overgrazed Public Domain range on the Bruneau desert north of Three Creeks, Idaho. The scarcity of herbaceous vegetation is outstanding, and its depletion has resulted in removal of much surface soil by wind and water. Note shallow surface gully at right of hat and hummocks of soil where protection has been given by clumps of sagebrush.

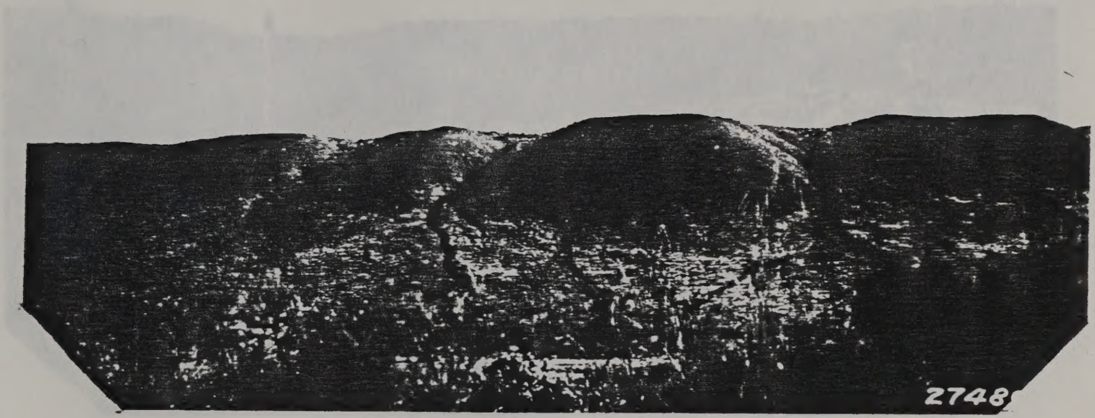

Photo No. 4. Numerous large gullies on a hillside in the desert-shrub type near Shoofly Creek northwest of Grandview, Idaho. Continued overgrazing depleted the plant cover which left the surface soil largely unprotected and subject to erosion. The rapid run-off from the depleted hillsides during a torrential rainstorm which occurred in 1931 caused many of the gullies shown in the picture.

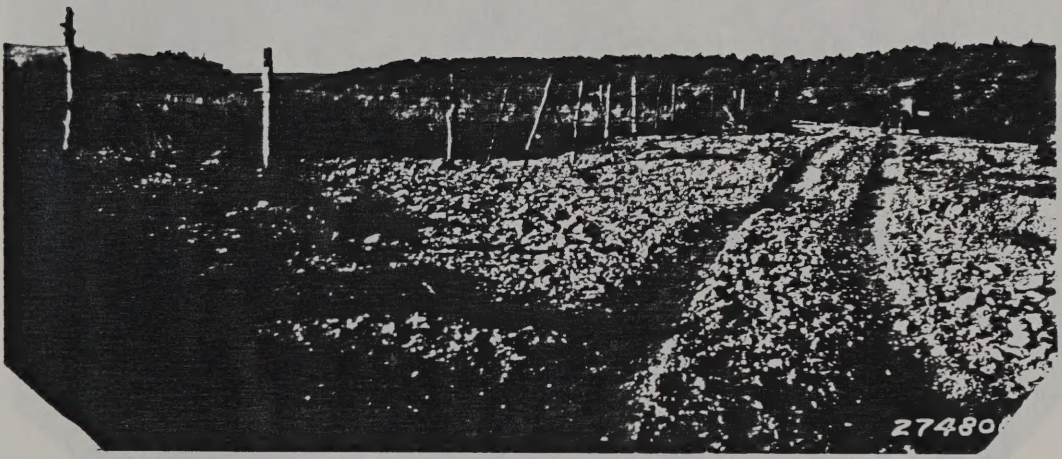

Photo No. 5. A gravel outwash in Owyhee County, Idaho, about eight miles southeast of Sheaville, Oregon. This was originated on overgrazed public domain range but was apparently checked at the fence-line of a fenced range on which the plant cover has been satisfactorily maintained due to moderate grazing. The grazing capacity of the open public domain range is about 90 percent less than that of the moderately grazed fenced range.

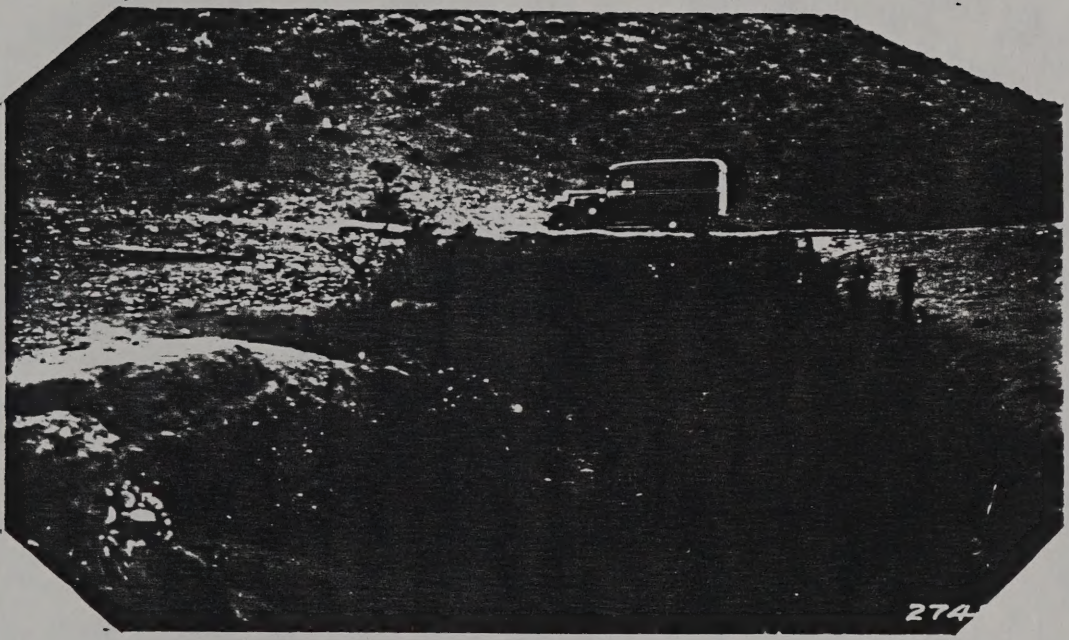

Photo No. 6. A bridge over a tributary of Rabbit Creek southwest of Murphy, Idaho. Accelerated erosion of the channel by heavy run-off from depleted open range is threatening total destruction of the bridge, thus contributing to increased road maintenance costs.

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